DETERMINING WILDLIFE RECREATION DEMAND BY ECOZONE-BASED WILDLIFE MANAGEMENT UNITS

A PROGRESS REPORT

by

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June 1988

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STATE: NEW YORK

PROJECT NO.: W-146-R:13

PROJECT TITLE: Public Attitudes Toward Wildlife and Its Accessibility

STUDY NUMBER AND TITLE: I- Deriving Social Indices of Public Attitudes Toward Wildlife Populations and Their Use

JOB NUMBER AND TITLE: I-12 - Determination of the Nature and Demographics of Wildlife Recreation Demand, by Ecozone-based Wildlife Management Units

JOB OBJECTIVES: To analyze the potential to stratify demand by ecozone and SMSA using secondary (existing) data sources.

To derive estimates of the relative size (i.e., extent and intensity) of wildlife demand based on assessments of secondary data.

To identify the need to collect primary data to estimate demand, and determine the feasibility of acquisition.

JOB DURATION: 1 January 1987 - 30 June 1989

INTRODUCTION

An earlier progress report for this job (I-12) reported on information collected for a basic demographic data base by ecozone and urban area (Connelly and Brown 1987). That data base is currently available to the New York State Department of Environmental Conservation (DEC) and is being used for planning purposes. But there is also a need to use this type of data to project the impact of changing demographics on demand for wildlife-related recreation. A companion job (I-11) is currently identifying important demographic factors affecting license sales (a measure of demand). Information from that job can feed into this one to help determine demographic impacts on demand. See Brown and Connelly (1988) for a more thorough discussion of how this linkage might take place.

This progress report examines methods to define hunting demand by ecozone-based wildlife management units (WMUs). An objective of this job is to estimate demand by WMU based on secondary data and to identify needs for the collection of primary data. An examination of available secondary data led to the conclusion that most of these data are outdated. The second section of this report will outline the secondary data available, but will deal primarily with data-collection needs. It is anticipated that primary data collection will require only slight modification of ongoing DEC user-survey work. The first section of the progress report will illustrate the uses of such data once they are collected.

SECTION A: USE OF DEMAND INFORMATION

This section will illustrate 3 possible uses of demand information. Imaginary WMUs and urban areas have been used to illustrate on a smaller scale than New York State the effects of new program implementation and changing demographics on demand by WMU.

Tables 1 through 3 and Figure 1 present hypothetical information about 3 WMUs and 2 Urban Areas which would be known from the demographic data base and primary data collection by DEC. Ideally, demand information would be species specific; so for these examples we have chosen ruffed grouse. Demand for ruffed grouse hunting, as would be true for other small game species, will be measured in days of participation in each WMU. Table 1 displays demand by WMU and the geographic source of that demand. This type of table is commonly referred to as an origin/destination table, and will provide the basis for most of our comparisons of change in demand.

Scenario 1

In this scenario WMU A has become overcrowded with hunters. Demand for grouse hunting is too high. Concerns have been raised about overly-depressed grouse population levels. From Table 4, which illustrates information on days of use in the 3 WMUs, it is clear that WMU A is experiencing greater levels of use. The management agency wants to redistribute use to underutilized WMUs B and C. Table 2, the origin/destination table, shows that the largest number of people using WMU A reside in Urban Area 2 (5,000 people). They spent 15,000 days in WMU A (Table 1), and account for three-fourths of its total use. If media and other communications efforts in Urban Area 2 were successful at

Table 1. Days of participation in ruffed grouse hunting by origin/destination.

Origin	Destination WMU A	WMU B	WMU C	Total Days Generated by Origin Area
WMU A	1,150	100	0	1,250
WMU B	400	1,950	150	2,500
WMU C	200	0	4,800	5,000
Urban Area 1	2,250	300	0	2,550
Urban Area 2	15,000	0	17,500	32,500
Total Days Use	19,000	2,350	22,450	43,800

Table 2. Number of people participating in ruffed grouse hunting by origin/destination.[a]

Origin	Destination WMU A	WMU B	WMU C
WMU A	250	50	0
WMU B	100	450	50
WMU C	50	0	1,000
Urban Area 1	750	300	0
Urban Area 2	5,000	0	7,500
Total	6,150	800	8,550

[a]People can hunt in more than 1 WMU, so totals by origin area would not reflect an accurate number of people.

Table 3. Other relevant information known about population.

Origin	Total Population	Population Aged 45+	Ruffed Grouse Hunter Population	Area of Habitat (Acres)
WMU A	2,000	300	250	1,000
WMU B	5,000	2,000	500	2,000
WMU C	9,000	3,000	1,000	5,000
Urban Area 1	20,000	8,000	1,000	
Urban Area 2	100,000	35,000	10,000	

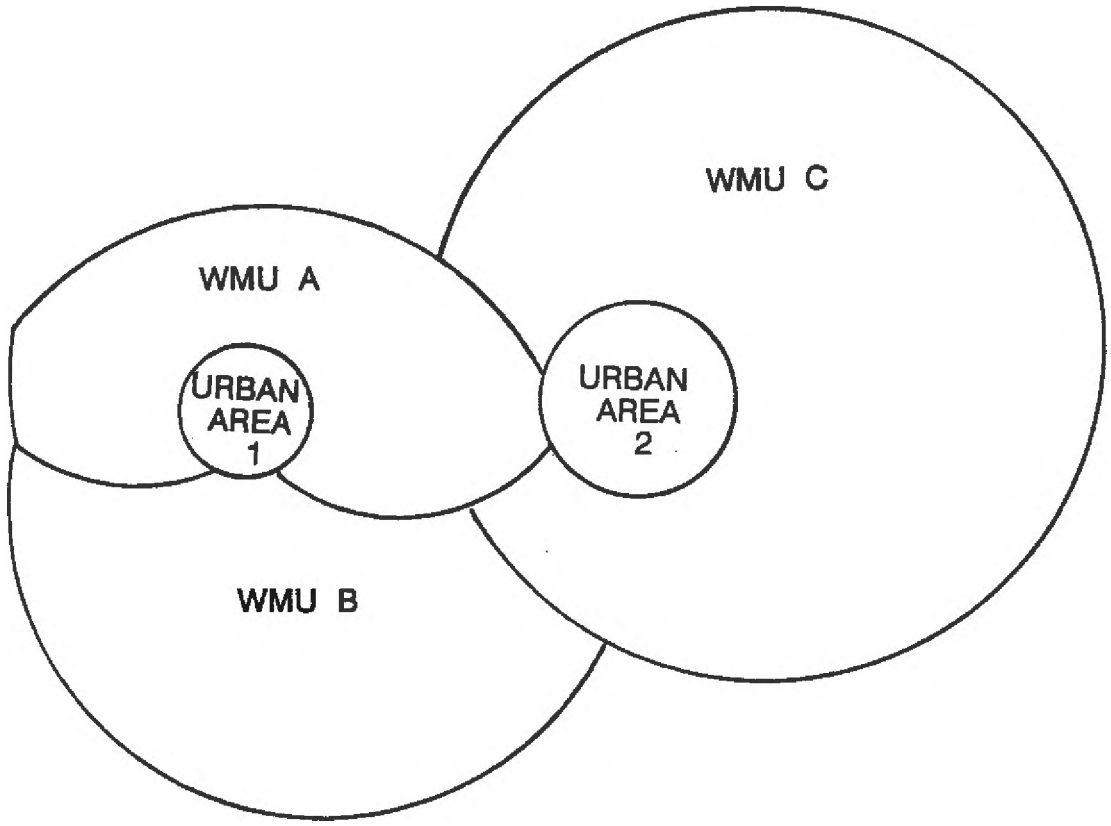

Figure 1. Map of example WMUs and urban areas.

Table 4. Days of use in each WMU before and after a successful hypothetical communications effort.

Destination	Original Situation		After Communications Effort	
	Days Use in WMU	Days Use/ Acre	Days Use in WMU	Days Use/ Acre
WMU A	19,000	19.0	11,500	11.5
WMU B	2,350	1.2	2,350	1.2
WMU C	22,450	4.5	29,950	6.0

promoting grouse hunting opportunities in WMU C such that one-half of the days now spent hunting in WMU A were spent in WMU C, how would days use/acre be redistributed? Table 4 shows the change in use distribution that would result.

Wildlife managers may have known about the high demand in WMU A, but they can identify hunters' residences from the origin/destination table and can thereby target efforts to promote opportunities in WMU C where it would be most effective. This general approach could be applied to the current deer management situation in New York where some deer management units (DMUs) are underutilized and there is a need to redistribute hunters to those DMUs.

Scenario 2

This scenario deals with the changing age structure of the population, but any of a number of demographic characteristics could have been chosen. It is important to remember that in reality all of the demographic factors are operating simultaneously. From our work modeling

license sales, age structure and urbanization seem to be 2 of the most important factors.

In this scenario future population projections indicate that the population is aging. Wildlife managers know from studies of hunting participation that as people get older they discontinue hunting. What effect will this have on the use of WMUs for grouse hunting? From the 1980 National Survey of Fishing, Hunting, and Wildlife-associated Recreation we know that 6% of people over age 45 hunt and 12% of people under age 45 hunt (USFWS 1980). This scenario projects a constant population size but a 5% increase in the number of people over age 45 in the next 5 years. Table 5 illustrates how this change will affect the number of hunters in each origin area in 5 years. We assume that the decline in the number of hunters in each origin area will result in a similar percentage decline in the number of days of hunting. Table 6 shows the change in the number of days of participation by origin/destination area. In general, these changes in demographics do not produce as dramatic a change in demand as in Scenario 1, but it is important to remember that many demographic factors are operating simultaneously. Project W-146-R staff are trying through our license-sale modeling efforts to identify the most important factors to use in scenarios like this one.

Scenario 3

In this scenario wildlife managers are considering implementing a new program and want to know the demand that will be generated in various WMUs. In this illustration the program is aimed at retaining young hunters who might otherwise drop out of hunting. For this imaginary area there are 750 Hunter Training Course registrants per year. Ten percent

Table 5. Change in age distribution and number of hunters based on Scenario 2.

Origin	Increase in Pop. 45+ Over 5 Years	# Hunters Currently in Increase Group	Decrease in # Hunters	# Hunters in 5 years	% Decline in # Hunters
WMU A	15	2	1	249	0
WMU B	100	12	6	494	2
WMU C	150	18	9	991	1
Urban Area 1	400	48	24	976	2
Urban Area 2	1,750	210	105	9,895	1

Table 6. Change in days of participation in grouse hunting under Scenario 2.

	Destination					
	WMU A		WMU B		WMU C	
Origin	Now	In 5 Years	Now	In 5 Years	Now	In 5 Years
WMU A	1,150	1,150	100	100	0	0
WMU B	400	392	1,950	1,911	150	147
WMU C	200	198	0	0	4,800	4,752
Urban Area 1	2,250	2,205	300	294	0	0
Urban Area 2	15,000	14,850	0	0	17,500	17,320

of them (75 people) are targeted to receive this experiential program. If the program is successful, 48 of the 75 people who were expected to drop out would continue hunting (using estimates from a report by Pomerantz and Decker 1986). If this program were to continue over a 5-year period, each year keeping 48 people in hunting who would otherwise have dropped out, there would be a 2% increase in the hunting population. We would assume that such an increase would result in a 2% increase in days of participation. Table 7 shows how WMU demand would be affected.

This type of analysis can point out WMUs where the number of hunters can be increased, and other WMUs where increasing the number of hunters could cause overharvest. Possibly in WMU A the projected increase in demand is deemed too high. We could then return to scenario 1 and chart

Table 7. Change in days of participation in grouse hunting under Scenario 3.

	Destination					
	WMU A		WMU B		WMU C	
Origin	Now	In 5 Years	Now	In 5 Years	Now	In 5 Years
WMU A	1,150	1,173	100	102	0	0
WMU B	400	408	1,950	1,989	150	153
WMU C	200	204	0	0	4,800	4,896
Urban Area 1	2,250	2,295	300	306	0	0
Urban Area 2	15,000	15,300	0	0	17,500	17,850
Total Days Use	19,000	19,380	2,350	2,397	22,450	22,899

the effects of another type of program which could prevent overharvest in WMU A.

Summary

The 3 scenarios were kept simple to illustrate the effect on demand of changing demographics and new program implementation. For this type of information to be useful in reality, models need to be developed which can examine the effects of several factors simultaneously to give an overall effect.

SECTION B: INFORMATION NEEDS

Information Needs Regarding Small Game Hunting

To produce the origin/destination tables used in Section A of this report for small game species, 3 data sources would be needed. The first is the small game telephone survey conducted each year by DEC. It contains the most current information on county of origin and WMUs of destination for each small game species hunted. The ecozone/demographics data base (Connelly and Brown 1987) would be needed to apportion county of origin information into WMUs and urban areas. This data base comes from the 1980 Census and therefore does not reflect recent population changes. The small game survey does not record days of participation, but that information could be obtained from the 1976 Hunter Access Study (Brown et al. 1978). Days of participation from that study are recorded as average number of days hunted statewide rather than by WMU of destination. To derive estimates of days of participation in each WMU the average total days would have to be divided by the number of WMUs hunted in.

Scenario 1 could be used to help redistribute use from oversubscribed to undersubscribed DMUs.

Recommendations

The development of models in which reasonable confidence can be ascribed will require accurate, up-to-date data. We believe the logical next step would be to have DEC implement the changes to the small game hunter telephone survey and DMU application coding suggested above. If these changes were implemented in the next cycle of data collection by DEC, then Project W-146-R staff could set up origin/destination tables to show the extent and intensity of demand (as laid out in Objective 2 of this job). The Lotus 1-2-3 computer software package would probably be most appropriate for this task. The time frame for deer hunting information could be as follows: (1) DEC codes information from DMP applications in Fall '88, (2) applicant information is transferred to Project W-146-R staff in January, and (3) origin/destination tables are created by the end of the AFA in June 1989. The time frame for small game hunting could be as follows: (1) information is collected during the 1989 small game hunter telephone survey, (2) information is coded and passed on to Project W-146-R staff by June 1989, and (3) in a continuing job the origin/destination tables are created, by December 1989.

If information obtained from origin/destination tables for small game hunting is desired by DEC before December 1989, another less accurate option is available. It consists of obtaining data from the 1988 small game hunter telephone survey, the ecozone/demographics data base, and the 1976 Hunter Access Study and, using procedures outlined in the small game hunting information needs section of this report, to

develop origin/destination tables. Analysis of this information could be completed by January 1989.

If after careful examination and use, DEC finds the origin/destination tables helpful for management planning, Project W-146-R staff could assist DEC in developing a system to create the tables each year in house. Project W-146-R staff would then be available to provide information on socio-demographic trends, but DEC would have the ability to use the tables to evaluate models and various possible scenarios on their own.

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